Day: Monday

Time: 10^{00}—10^{30}

Name: Baris Sertkaya

Titel: Computing the Least Common Subsumer w.r.t a Background Terminology

Abstract: Methods for computing the least common subsumer (lcs) are usually restricted to rather inexpressive Description Logics (DLs) whereas existing knowledge bases are written in very expressive DLs. In order to allow the user to re-use concepts defined in such terminologies and still support the definition of new concepts by computing the lcs, the notion of the lcs of concept descriptions is extended to the notion of the lcs w.r.t. a background terminology. In this talk I will present both a theoretical result on the existence of the lcs in this setting, and describe a practical approach (based on formal concept analysis) for computing "good" common subusumers, which may however not be the least ones.

Day: Monday

Time: 14^{00}—15^{00}

Name: Andreas Maletti

Titel: The Power of Tree Series Transducers of Type I and II

Abstract: Answering a question raised by Ésik & Kuich, the power of tree series transducers of type I and II is studied for IO as well as OI tree series substitution. More precisely in the IO case, it is shown that tree series transformations of type II are characterized by the composition of homomorphism top-down tree series transformations with linear bottom-up tree series transformations. This nicely generalizes the classical situation for top-down tree transducers with regular look-ahead, because the result that the linear tree series transformations of type II are exactly the linear bottom-up tree series transformations is also obtained. Moreover, it is proved that the tree series transformations of type I are precisely the composition of homomorphism top-down tree series transformations with bottom-up tree series transformations. It follows that each bottom-up tree series transformation is also a tree series transformation of type I. On the other hand for OI tree series substitution, polynomial tree series transducers of type I and II and top-down tree series transducers are all equally powerful.

Day: Monday

Time: 15^{30}—16^{30}

Name: Loránd Muzamel

Titel: A Decomposition Result concerning Macro Pebble Tree Transducers (Together with Zoltán Fülöp)

Abstract: The n-pebble tree transducer (shortly n-ptt) was proposed as a formal model for XML query languages by Tova Milo, Dan Sucio and Victor Vianu in 2000. We consider the version introduced by Joost Engelfriet and Sebastian Maneth in 2002. It is a finite state device that translates ordered ranked trees. Its reading head is a pointer to a node of the input tree and can be moved along the edges of the input tree. The n-ptt is equipped with n pebbles, marked $1, \ldots, n$, which can be dropped at and lifted from the current node. During the computation, the positions of dropped pebbles may serve extra information, and with increasing the value of n, the transformation capacity of n-pebble tree transducers also increases. So $0\text{-}PTT \subset 1\text{-}PTT \subset 2\text{-}PTT \subset \ldots$, where $n\text{-}PTT$ means the class of n-pebble tree transformations. We note that $0\text{-}PTT = ATT$, where ATT is the class of attributed tree transformations first defined in 1981 by Zoltán Fülöp. The n-pebble macro tree transducer (shortly n-pmtt) is the macro-way extension of n-pebble tree transducers, so that the states have a rank and the derivation steps respect *parameters*. (Macro tree transducers were introduced by Joost Engelfriet in 1980.) We denote the class of n-pebble tree transformations (n-pebble macro tree transformations) by $n\text{-}PMTT$. Also for macro case the more amount of pebbles makes greater transformational power. So $0\text{-}PMTT \subset 1\text{-}PMTT \subset 2\text{-}PMTT \subset \ldots$. The class of the yield tree transformations, which can be defined in a very simple recursive way and can be realized by 0-ptts, was defined by Joost Engelfriet in 1977. We introduce partial yield mappings in terms of the OI substitution. We denote the class of partial yield mappings by $YIELD$.

We will show the following decomposition results:

- $n\text{-}dPMTT_{ssn} \subseteq n\text{-}dPTT_{sn} \circ YIELD$ and

- n-$lpPMTT_{ssn} \subseteq n$-$PTT_{sn} \circ YIELD$,

where in this case the prefixes d, lp refer to deterministic and "linear in parameters" transformation classes, while the subscripts ssn, sn mean that the transducers, inducing the appropriate transformations, are not strictly statically circular and statically non-circular respectively. The corollary of these results are that n-$dPMTT_{ssn} \subseteq 0$-$dPTT_{sn}^{n+2}$ and n-$lpPMTT_{ssn} \subseteq n$-PTT_{sn}^{n+2}.

There are many open problems left related to pebble transducers, which are waiting for answer. One of them is whether the statical circularity of n-ptts is decidable or not.

Day: Monday

Time: 16^{30}—17^{00}

Name: Boontawee Suntisrivaraporn

Titel: An Efficient Implementation of a Subsumption Algorithm in $\mathcal{EL}$ w.r.t. General TBoxes

Abstract: It has been shown recently that the small Description Logic (DL) $\mathcal{EL}$, which allows for conjunction ($\sqcap$) and existential restrictions ($\exists r.C$), has nice algorithmic properties. In particular, the key inference problems in this logic such as concept subsumption are decidable in polynomial time even w.r.t. general TBoxes, i.e., TBoxes augmented by general concept inclusion (GCI) axioms.

Moreover, there are applications where the expressive power of $\mathcal{EL}$ appears to be sufficient. For example, the Gene Ontology—which is a controlled vocabulary of gene products—can be seen as a (general) TBox with one role name. In this talk, I will present a tractable algorithm for computing subsumption in $\mathcal{EL}$. After that, I will show the evaluation results of our implementation using the Gene Ontology as benchmark. The performance will be compared with that of RACER, which is regarded as the best DL system available today.

Day: Tuesday

Time: 9^{00}—10^{00}

Name: Maja Miličić

Titel: Integrating Description Logics and Action Formalisms for Reasoning about Web Services

Abstract: Motivated by the need for semantically well-founded and algorithmically managable formalisms for describing the functionality of Web services, we introduce an action formalism that is based on description logics (DLs), but is also firmly grounded on research in the reasoning about action community. Our main contribution is an analysis of how the choice of the DL influences the complexity of standard reasoning tasks such as projection and executability, which are important for Web service discovery and composition.

Day: Tuesday

Time: 10^{00}—10^{30}

Name: Jin Yi

Titel: Belief Change for Reasoning Agents

Abstract: The talk starts with a short introduction to belief change. I also will discuss our own contributions to belief change. Then I present a solution of integrating belief change into action formalisms. Finally, the work in progress and future work will be described.

Day: Tuesday

Time: 14^{00}—15^{00}

Name: Ulrike Püschmann

Titel: On a decision procedure for an interval logic

Abstract: Interval logics are temporal logics for specification and verification of concurrent systems. They allow to specify properties of temporal contexts rather than of time instants conveniently. For most other interval logics the decision problem is non-elementary or undecidable.

Alternating automata are a generalization of nondeterministic automata. They have proven to be useful obtaining a decision procedure for Linear Temporal Logic.

This talk will present an interval logic with a decision procedure based on alternating automata.

Day: Tuesday

Time: 15^{30}—16^{30}

Name: Sebastian Bader

Titel: Neural Symbolic Integration - a Proposal for my PhD

Abstract: Starting with an overview on Neural-Symbolic-Integration, I will present recent developments in that area. This includes already published results as well as work in progress. Furthermore, I will give an outline of my PhD and a roadmap for 2005.

Day: Tuesday

Time: 16^{30}—17^{00}

Name: Björn Borchard

Titel: Rijndael - The Advanced Encryption Standard

Abstract: In January 1997, the US National Institute of Standards and Technology announced to start of an initiative to develop a new encryption standard: the Advanced Encyrption Standard (AES). The new encryption standard was to become a Federal Information Processing Standard, replacing the old Data Encryption Standard. In October 2000, "Rijndael" was announced as the winner of the contest for the new AES. We present "Rijndael" and discuss several cryptoanalytic properties.

Day: Wednsday

Time: 9^{00}—10^{00}

Name: Konstantin Tchekine

Titel: Coalgebraic Semantics of SystemC

Abstract: Hardware and software systems constantly grow in functionality and complexity. This trend increases the probability of "bugs" and errors. Some of these errors may cause catastrophic loss of money. The integration of formal methods can greatly increase quality of the produced systems. The problem is that the commercial pressure to produce higher-quality hardware and software is always increasing, and the development time decreasing.

The formal methods should be easy to use and should provide a starting point for writing formal specifications for developers who would not otherwise write them. By this reason we have chosen a modeling language SystemC, which is widely used in hardware and software development for specification and simulation. SystemC is a library of C++ classes, and since C++ has no formal language semantics, so SystemC has no formal semantics. If we want to extend SystemC in the direction of verification and to create a tool support for verification, SystemC would need a formal semantics. We are offering a way how one could give SystemC a formal coalgebraic semantics. We model every input, output and internal variable of an object (module) in SystemC by means of the infinite streams, whereas the object is modeled by an ordered quintuple: inputs, internal variables, outputs, initial states and a relation on all these streams. The coalgebraic semantics of the object is given by means of the greatest invariant contained in the set defined by this relation. The reason to be interested in the coalgebraic representation of streams and objects is that there exists a number of results on coalgebras in general, which we apply to show the consistency of our formalization of SystemC.

Day: Wednsday

Time: 10^{00}—10^{30}

Name: Maja Pech

Titel: On endomorphism monoids of Rosenberg relations

Abstract: In this talk I will give a summary of my research work during the last 2 years.I will talk about the partial ordered set of traces of maximal clones over a finite set. It turns out that this poset has a surprisingly rich structure.

Day: Wednsday

Time: 11^{00}—12^{00}

Name: Christian Pech

Titel: A weighted version of McNaughtons Theorem (together with Alexandre Scalzitti)

Abstract: We consider infinitary formal power-series over the real max-plus semiring that are recognized by weighted automata with deflation parameter. For certain deflation parameters we characterize all Büchi-recognizable formal power-series, that are Muller-recognizable

---